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EXAMINER	
ABDI, AMARA	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,645	GHOSH ET AL.	
	Examiner	Art Unit	
	Amara Abdi	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,11 and 14-20* is/are pending in the application.

4a) Of the above claim(s) *10,12 and 13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11 and 14-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08/27/2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's response to the last office action, filed on April 16^{th}, 2008 has been entered and made of record.

2. In view of the Applicant amendments, the rejection of claims 9-13 under 35 U.S.C 101 is expressly withdrawn.

Remarks

3. Applicant's argument with respect to claims 1-9, 11, and 14-20 have been fully considered, but they are not persuasive.

(a) Applicant argues that the Examiner is entirely incorrect in citing Yakhini as teaching, disclosing, mentioning, or even suggesting the first step of claim 1.

However, in response to applicant's argument, the Examiner disagrees because Yakhini et al. (EP 1 162 572) as shown in Figure 2, clearly teach the classifying of pixels in the region of interest (the regions where pixels 202 and 204 are belonging are read as regions of interest) as either pixels with intensity values of non-zero pixels (background pixels) and pixels with low or zero intensity values (feature pixels) based on the intensity of the pixels witch ranging from 0 to 9 (See Fig.2, paragraph [0004], line 7-20).

(b) Applicant argues that the Mittal reference has nothing to do with the microarray images, and it is directed to entirely different and unrelated subject matter.

However, in response to applicant's argument, the Examiner disagrees because generally speaking, the invention is directed to microarray image using the techniques

of image processing such as the classifying of pixels as either background pixels or feature pixels. Thus any reference using the techniques of image processing such as the estimating of pixels as either feature pixels or background pixels using the probability could be used in combination with the microarray image references. In the instant case, Mittal. et al. reference is used to produce an understandable rational for linking to the Yakhini et al. reference, where Mittal. et al. teach the computing of the probability of the pixels to estimate either the pixels are feature or background. Therefore Yakhini et al. and Mittal. et al. in combination both deal with the microarray image and the classifying of pixels as either background pixels or feature pixels using the probability, Which makes the two references analogous to each other with no type of improper use of hindsight. Furthermore, regarding the combination of Yakhini et al. and Mittal references, the Examiner would like to point out the following precision:

Yakhini et al. disclose a method the classifying of pixels of microarray image in the region of interest (See Fig. 2, the regions where pixels 202 and 204 are belonging are read as regions of interest) as either feature pixels (pixels with low or zero intensity values) or background pixels (pixels with intensity values of non-zero pixels) based on pixel locations (the location is read as a the same as region of interest) and intensities (the intensity of the pixels witch ranging from 0 to 9) (See Fig. 2, paragraph [0004], line 7-20).

Yakhini et al. do not explicitly mention iteratively computing, the probabilities that the pixels are feature pixels and probabilities that the pixels are background pixels.

Mittal et al., teaches the computing of the probability of the pixels to estimate either the pixels are feature or background (paragraph [0019], line 9-13), (it is read that the pixels are estimated as feature pixels or background pixels based on the comparison with the threshold).

All the elements of claim 1 are known by Yakhini et al. and Mittal et al. references. The only difference is the combination of the probability to estimate the pixels as being a feature pixels or background pixels, with the method of classifying the pixels of microarrays image.

In addition the KSR states: “All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yield predictable results to one of ordinary skill in the art at the time of the invention”

Thus, it would have been obvious to one having ordinary skill in the art to use the probability of estimating the pixels as being a feature pixels or background pixels as thought by Mittal et al. with the method of classifying the pixels of microarrays image as shown by Yakhini et al., since the probability of estimating the pixels as being a feature pixels or background pixels could be used in combination with the method of classifying the pixels of microarrays image to achieve the predictable results of including scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

Therefore, claim 1 and its independent claims are still not in condition for allowance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. (EP 1 162 572) in view of Mittal et al. (US-PGPUB 2005/0286764).

(1) Regarding claim 1:

Yakhini et al. disclose a method the classifying of pixels of microarray image in the region of interest (See Fig. 2, the regions where pixels 202 and 204 are belonging are read as regions of interest) as either feature pixels (pixels with low or zero intensity values) or background pixels (pixels with intensity values of non-zero pixels) based on pixel locations (the location is read as a the same as region of interest) and intensities (the intensity of the pixels witch ranging from 0 to 9) (See Fig. 2, paragraph [0004], line 7-20).

Yakhini et al. do not explicitly mention iteratively computing the probabilities that the pixels are feature pixels and probabilities that the pixels are background pixels.

Mittal et al., teaches the computing of the probability of the pixels to estimate either the pixels are feature or background (paragraph [0019], line 9-13), (it is read that the pixels are estimated as feature pixels or background pixels based on the comparison with the threshold).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where computing the probability that the pixels are either a feature pixels or background pixels, in the system of Yakhini et al. in order to including scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(2) Regarding claim 2:

Yakhini et al. further disclose the method, where storing the feature-pixel and background-pixel classification (paragraph [0084], line 13-14), (the storing of the values in the array is read as the same concept as the storing of feature-pixel and background-pixel classification in a feature mask).

(3) Regarding claim 3:

Yakhini et al. disclose all the subject matter as described in claim 2 above.

Yakhini et al. do not explicitly mention the method, where the feature mask includes binary values corresponding to pixels in the region of interest, a first binary value indicating that a corresponding pixel is a feature pixel and a second binary value indicating that a corresponding pixel is a background pixel.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where using a binary mask as the difference between the present frame (feature pixel) and (background pixel) (paragraph [0118], line 2-6), (it is obvious to have first binary and the second binary since the difference is binary mask).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where using a binary value as difference between present frame (feature pixel) and (background pixel), in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(4) Regarding claim 4:

Yakhini et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. do not explicitly mention the method, where determining a high pixel intensity and a low pixel intensity for the region of interest; determining an intermediate point between the high pixel intensity and a low pixel intensity; classifying pixels with observed pixel intensities greater than or equal to the intermediate point as feature pixels and classifying pixels with observed pixel intensities less than the intermediate point as background pixels; and iteratively reclassifying pixels based on an intermediate intensity between the mean intensity of feature pixels and the mean intensity of background pixels.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where the statistical method utilizes optical flow for capturing the dynamic of the scene. Along with optical flow, the intensity of a pixel is considered in an illumination-invariant space (paragraph [0017], line 2-5), and classifying the pixels based on the value of threshold (paragraph [0019], line 11-13), and iteratively reclassifying pixels based on the value of the threshold (paragraph [0019], line 9-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where determining the intensity of the pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claim 1 above, and further in view of Lee et al. (US-PGPUB 2004/0202368).

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention the identifying of hole pixels that are feature pixels surrounded by background pixels and background pixels surrounded by feature pixels and reclassifying hole pixels in order to increase the continuity of feature-pixel and background pixel classification with respect to location within the region of interest.

Lee et al., in analogous environment, teaches a learnable object segmentation, where detecting the hole pixels as feature pixels surrounded by background pixels and background pixels surrounded by feature pixels (paragraph [0084], line 2-8), (the examiner interpreted that some of feature pixels are within the boundary, and some of the them are outside the region of interest, and the same thing applies to the

background pixels). And reclassifying the hole pixels in order to increase the continuity of feature-pixel and background pixel classification with respect to location within the region of interest (paragraph [0121], line 3-11; and paragraph [0123], line 3-6), (the increasing of the continuity of feature-pixel and background pixel classification is read as filling the holes to remove extraneous pixels and smooth region boundaries).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Lee et al., where identifying the hole pixels, in the system of Yakhini et al. in order to provides an accurate and robust method for object segmentation on complicated object types, as well as providing a semi-automatic method for user to train the segmentation recipe (paragraph [0010], line 2-6).

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claims 1 and 15 above, and further in view of Bow et al. (STIC), (pattern recognition and image preprocessing [electronic resource]).

(1) Regarding claim 6:

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention the method, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where using Bayes discriminant function for given probability function that the state nature is a pattern belonging to certain class (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)) (Page 85, line 16-22). Also classifying a pixel as a feature pixel when {P(x/wk)P(wk)> P(x/wi)P(wi)} (Page 87, line 21-24), (the examiner interpreted that P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi)), until a maximum number of iterations are performed (Page 88, line 7-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

(2) Regarding claim 7:

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 6 above.

Yakhini et al. and Mittal et al. do not explicitly mention the method, where the Bayesian posterior probability P(F/I,x) is calculated as: P(F/I,x)=P(F,I,x)/P(I/x)={P(i/x,F)*P(F,x)}/P(I,x)= { P(i/x,F)*P(F/x)}/P(x)}/P(I,x)
and where the Bayesian posterior probability P(B/I,x) is calculated as:

P(B/I,x)=P(B,I,x)/P(I/x)={P(i/x,B)*P(B,x)}/P(I,x)= { P(i/x,B)*P(B/x)}/P(x)}/P(I,x), where the pixel is classified as a feature pixel where : P(F/I,x)/ P(B/I,x)>=1 as recited in claim 7.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where the Baye's discriminant function is written as: P(wi/x)={P(x/wi)*P(wi)}/ P(x) (Page 85, line 16), (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)), and {P(x/wk)P(wk)> P(x/wi)P(wi)}, where : P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi) (Page 87, line 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where calculating the Bayesian posterior probability, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Mittal et al., and Bow et al. (STIC), as applied to claims 7 and 19 above, and further in view of Padilla et al. (US-PGPUB 2003/0233197).

Yakhini et al., Mittal et al., and Bow et al. (STIC) disclose all the subject matter as described in claim 7 above.

Yakhini et al., Mittal et al., and Bow et al. (STIC) do not explicitly mention the method, where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray.

Padilla et al., in analogous environment, teaches a discrete Bayesian analysis of data, where using microarray to contain a human genes including intensities (paragraph [0312], line 10-13), and a series of channel grooves, or spots are formed on substrate and reagents are selectively flowed through the channels (paragraph [0085], line 15-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Padilla et al., where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray, in the system of Yakhini et al. in order to predict outcomes of other conditions or perturbations or to identify conditions or perturbations, for diagnosis or for other predictive analysis (paragraph [0008], line 11-13).

9. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Mittal et al., as applied to claim 1 above, and further in view of Gelenbe et al. (US 5,995,651).

(1) Regarding claim 9:

Yakhini et al. and Mittal et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. and Mittal et al. do not explicitly mention a computer instruction encoded in a computer-readable medium that implements the method of claim 1 as recited in claim 9.

Gelenbe et al., in analogous environment, teaches an image content

classification method, system and computer program using texture patterns, where a computer program is used to implement the method (column 1, line 60).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Gelenbe et al., where the method is implemented in a computer program, in the system of Yakhini et al. in order to provide method and computer programs which are highly accurate which may operate at high speeds, so that large volumes of images data may be processed (column 1, line 62,63; and line 66-67).

(2) Regarding claim 11:

Yakhini et al. disclose all the subject matter as described in claim 1 above.

Yakhini et al. do not explicitly mention the feature location and size determination step that includes the method for classifying pixels with observed intensities within the region of interest; and the feature extraction program.

(a) Obviousness in view of Mittal et al.

Mittal et al. disclose a feature location (paragraph [0093], line 2-4) and size determination step (paragraph [0081], line 3-6) that includes the method for classifying pixels (paragraph [0011], line 5-7) with observed intensities within the region of interest of claim 1 (paragraph [0017], line 3-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where classifying pixels, in the system of Yakhini et al. in order to provide background modeling techniques of

extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(b) Obviousness in view of Gelenbe et al.

Gelenbe et al., in analogous environment, teaches an image content classification method, system and computer program using texture patterns, where a computer program is used in the system (column 1, line 60).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Gelenbe et al., where the computer program is used, in the system of Yakhini et al. in order to provide method and computer programs which are highly accurate which may operate at high speeds, so that large volumes of images data may be processed (column 1, line 62, 63; and line 66-67).

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. in view of Shames (US 6,990,221).

Yakhini et al. disclose a feature-extraction system comprising:

a means for receiving and storing a scanned image of a microarray (paragraph [0003], line 3-4);

a gridding means for determining putative feature positions (paragraph [0018], line 2-3) and sizes (paragraph [0034], line 1-2) within the scanned image of the microarray (paragraph [0001], line 3-4);

feature-mask-generating logic that classifies pixels as feature-pixels and background-pixels (paragraph [0001], line 1-4) based on pixel locations (paragraph [0005], line 1-8) and intensities (paragraph [0004], line 7-10);

a feature extraction module that extracts signal data from the scanned image of the microarray (paragraph [0006], line 8-10).

Yakhini et al. do not explicitly mention the preview-mode display logic that displays feature positions and sizes obtained from the generated feature mask, solicits feedback from a user, and corrects the feature positions and sizes.

Shams, in analogous environment, teaches an automated and array image segmentation and analysis, where displaying feature positions and sizes obtained from the generated feature mask (column 10, line 41-41), (the displaying of the image frame is read as the same concept as the displaying of the feature positions and sizes), solicits feedback from a user (column 10, line 51-54), and corrects the feature positions (column 10, line 49-50), and sizes (column 2, line 24-26), (the adjusting of position and size is read as the same concept as the correcting of position and size);

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Shams, where displaying the image frames, in the system of Yakhini et al. in order to process irregular micro-array patterns, search for DNA image spots, and accurately quantify, and intuitively display, specific signals while accounting for the local background (column 3, line 10-16).

11. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al. and Shames, as applied to claim 14 above, and further in view of Mittal et al. (US-PGPUB 2005/0286764).

(1) Regarding claim 15:

Yakhini et al. and Shames disclose all the subject matter as described in claim 14 above. Furthermore, Yakhini et al. disclose a method the classifying of pixels of microarray image in the region of interest (See Fig. 2, the regions where pixels 202 and 204 are belonging are read as regions of interest) as either feature pixels (pixels with low or zero intensity values) or background pixels (pixels with intensity values of non-zero pixels) based on pixel locations (the location is read as a the same as region of interest) and intensities (the intensity of the pixels witch ranging from 0 to 9) (See Fig. 2, paragraph [0004], line 7-20).

Yakhini et al. and Shames do not explicitly mention iteratively computing the probabilities that the pixels are feature pixels and probabilities that the pixels are background pixels.

Mittal et al., teaches the computing of the probability of the pixels to estimate either the pixels are feature or background (paragraph [0019], line 9-13), (it is read that the pixels are estimated as feature pixels or background pixels based on the comparison with the threshold).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where computing the probability that the pixels are either a feature pixels or background pixels, in the system of Yakhini

et al. in order to including scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

(2) Regarding claim 16:

Yakhini et al. further disclose the method, where storing the feature-pixel and background-pixel classification (paragraph [0084], line 13-14), (the storing of the values in the array is read as the same concept as the storing of feature-pixel and background-pixel classification in a feature mask).

(3) Regarding claim 17:

Yakhini et al. and Shames disclose all the subject matter as described in claim 15 above.

Yakhini et al. and Shames do not explicitly mention the method, where determining a high pixel intensity and a low pixel intensity for the region of interest; determining an intermediate point between the high pixel intensity and a low pixel intensity; classifying pixels with observed pixel intensities greater than or equal to the intermediate point as feature pixels and classifying pixels with observed pixel intensities less than the intermediate point as background pixels; and iteratively reclassifying pixels based on an intermediate intensity between the mean intensity of feature pixels and the mean intensity of background pixels.

Mittal et al., in analogous environment, teaches a method for scene modeling and change detection, where the statistical method utilizes optical flow for capturing the dynamic of the scene. Along with optical flow, the intensity of a pixel is considered in an illumination-invariant space (paragraph [0017], line 2-5), and classifying the pixels

based on the value of threshold (paragraph [0019], line 11-13), and iteratively reclassifying pixels based on the value of the threshold (paragraph [0019], line 9-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Mittal et al., where determining the intensity of the pixels, in the system of Yakhini et al. in order to provide background modeling techniques of extended scope to include scenes that exhibit a consistent pattern of change of the observation space in the spatio-temporal domain (paragraph [0012], line 1-4).

12. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Shames, and Mittal et al., as applied to claim 15 above, and further in view of Bow et al. (STIC), (pattern recognition and image preprocessing [electronic resource]).

(1) Regarding claim 18:

Yakhini et al., Shames, and Mittal et al. disclose all the subject matter as described in claim 15 above.

Yakhini et al., Shames, and Mittal et al. do not explicitly mention the method, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where using Bayes discriminant function for given probability function that the state nature is a pattern belonging to certain class (the examiner

interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)) (Page 85, line 16-22). Also classifying a pixel as a feature pixel when {P(x/wk)P(wk)> P(x/wi)P(wi)} (Page 87, line 21-24), (the examiner interpreted that P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi)), until a maximum number of iterations are performed (Page 88, line 7-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where classifying the pixel as feature when P(F/I,x)>=P(B/I,x); until a maximum number of iterations are performed, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

(2) Regarding claim 19:

Yakhini et al., Shames, and Mittal et al. disclose all the subject matter as described in claim 18 above.

Yakhini et al., Shames, and Mittal et al. do not explicitly mention the method, where the Bayesian posterior probability P(F/I,x) is calculated as: P(F/I,x)=P(F,I,x)/P(I/x)={P(i/x,F)*P(F,x)}/P(I,x)= { P(i/x,F)*P(F/x)}/P(x)}/P(I,x)

and where the Bayesian posterior probability P(B/I,x) is calculated as:

P(B/I,x)=P(B,I,x)/P(I/x)={P(i/x,B)*P(B,x)}/P(I,x)= { P(i/x,B)*P(B/x)}/P(x)}/P(I,x), where the pixel is classified as a feature pixel where : P(F/I,x)/ P(B/I,x)>=1 as recited in claim 7.

Bow, sing-Tze, in analogous environment, teaches a pattern recognition and image preprocessing, where the Baye's discriminant function is written as: P(wi/x)={P(x/wi)*P(wi)}/ P(x) (Page 85, line 16), (the examiner interpreted that P(wi/x) has the same concept as P(F/I,x) and P(B/I,x)), and {P(x/wk)P(wk)> P(x/wi)P(wi)}, where : P(F/I,x)= P(x/wk)P(wk), and P(B/I,x)= P(x/wi)P(wi) (Page 87, line 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Bow, sing-Tze, where calculating the Bayesian posterior probability, in the system of Yakhini et al. in order to speed up the processing of an image, it is therefore necessary to explore a way to accurately represent the image with much less amount of data but without losing any important information for the interpretation (Page 10, line 31-35).

13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yakhini et al., Shames, Mittal et al., and Bow et al. (STIC), as applied to claim 19 above, and further in view of Padilla et al. (US-PGPUB 2003/0233197).

Yakhini et al., Shames, Mittal et al., and Bow et al. disclose all the subject matter as described in claim 7 above.

Yakhini et al., Shames, Mittal et al., and Bow et al. do not explicitly mention the method, where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray.

Padilla et al., in analogous environment, teaches a discrete Bayesian analysis of data, where using microarray to contain a human genes including intensities (paragraph

[0312], line 10-13), and a series of channel grooves, or spots are formed on substrate and reagents are selectively flowed through the channels (paragraph [0085], line 15-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Padilla et al., where Bayesian posterior probabilities are calculated for each channel of a two-channel microarray, in the system of Yakhini et al. in order to predict outcomes of other conditions or perturbations or to identify conditions or perturbations, for diagnosis or for other predictive analysis (paragraph [0008], line 11-13).

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571)270-1670. The examiner can normally be reached on Monday through Friday 8:00 Am to 4:00 PM E.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Amara Abdi/
Examiner, Art Unit 2624

/Jingge Wu/

Supervisory Patent Examiner, Art Unit 2624